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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/808,864 | 03/15/2001 | Jigish D. Trivedi | MIO 0079 PA | 5568 |

7590

06/04/2003

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EXAMINER

FOONG, SUK SAN

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,864

Applicant(s)

TRIVEDI ET AL

Examiner

Suk-San Foong

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 21-28 and 31-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 21-28 and 31-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 6-11, 13-16, 21-26, 31, 33, 36 are 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in combination with Kizilyalli et al. ('807), as previously applied, and Shibata ('679) or Liu ('124).

AAPA and Kizilyalli et al. are relied on for the teachings discussed in the rejections of paragraph 10 of the Office Action mailed on 2/18/03.

The combination process does not disclose that diffusion barrier layer is oxide.

Shibata teaches forming a gate electrode structure which includes forming oxide layer 8 interposed between doped polysilicon layer 3 and metal silicide layer 4 (Col. 3, lines 2-18, and Fig. 2B); wherein oxide layer 8 for inhibiting impurity diffusion (Col. 3, lines 59-64).

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It would have been within the scope to one ordinary skill in the art to combine the teachings of the combination process with Shibata because it would enable formation of diffusion barrier layer 50 of the combination process to be performed and obtain further advantage of inhibiting impurity diffusion (Shibata, Col. 3, lines 59-64).

Alternatively, Liu discloses a prior art process of forming CMOS gate structure which includes forming an oxide diffusion barrier layer between a metal silicide layer and doped polysilicon layer for preventing diffusion of dopants from polysilicon layer into metal silicide layer (Col. 1, lines 46-50 and Col. 2, lines 42-52).

It would have been within the scope to one ordinary skill in the art to combine the teachings of the combination process of AAPA and Kizilyalli et al. with Liu because it would enable formation of diffusion barrier layer 50 of the combination process to be performed.

The choice of thickness of the diffusion barrier layer would have been a matter of routine optimization to achieve the desired device and the desired device characteristics of the device to be formed. (See MPEP 2144.05).

4. Claims 4, 5, 27, 28, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in combination with Kizilyalli et al. ('807) and Shibata ('679) or Liu ('124) as applied to claims 1-3, 6-11, 13-16, 21-26, 31, 33, 36 are 38-40 above, and further in view of Fujii et al. ('010) as previously applied.

Fujii et al. is relied on for the teachings discussed in the rejections of paragraph 11 of the Office Action mailed on 2/18/03.

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5. Claims 1-3, 6, 9, 10-16, 21-26, 31-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in combination with Hunter et al. ('725), as previously applied, and Shibata ('679) or Liu ('124).

AAPA and Hunter et al. are relied on for the teachings discussed in the rejections of paragraph 1 of the Office Action mailed on 2/18/03.

The combination process does not disclose that diffusion barrier layer is oxide.

Shibata teaches forming a gate electrode structure which includes forming silicon dioxide layer 8 interposed between doped polysilicon layer 3 and metal silicide layer 4 (Col. 3, lines 2-18, and Fig. 2B); wherein oxide layer 8 for inhibiting impurity diffusion (Col. 3, lines 59-64).

It would have been within the scope to one ordinary skill in the art to combine the teachings of the combination process with Shibata because it would enable formation of diffusion barrier layer 48 of the combination process to be performed and obtain further advantage of inhibiting impurity diffusion (Shibata, Col. 3, lines 59-64).

Alternatively, Liu discloses a prior art process of forming CMOS gate structure which includes forming a silicon dioxide diffusion barrier layer between a metal silicide layer and doped polysilicon layer for preventing diffusion of dopants from polysilicon layer into metal silicide layer (Col. 1, lines 46-50 and Col. 2, lines 42-52).

It would have been within the scope to one ordinary skill in the art to combine the teachings of the combination process of AAPA and Hunter et al. with Liu because it would enable formation of diffusion barrier layer 48 of the combination process to be performed.

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The choice of thickness of the diffusion barrier layer would have been a matter of routine optimization to achieve the desired device and the desired device characteristics of the device to be formed. (See MPEP 2144.05).

Double Patenting

6. Applicant is advised that should any of claims 1 to 16 be found allowable, claim 40 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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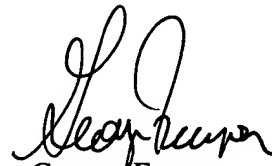
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suk-San Foong whose telephone number is 703-305-0383. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431, 3432).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

SK
May 30, 2003


George Fourson
Primary Examiner
Art Unit 2823